

Name: _____

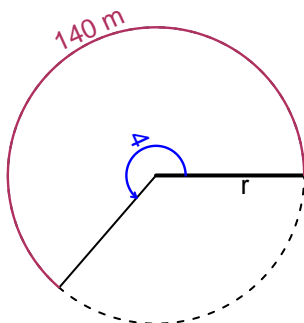
Date: _____

Trig Final (TEST v695)

- You should have a calculator (like [Desmos](#)) and a [unit-circle](#) reference sheet.

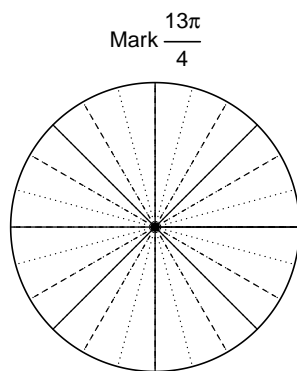
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 4 radians. The arc length is 140 meters. How long is the radius in meters?

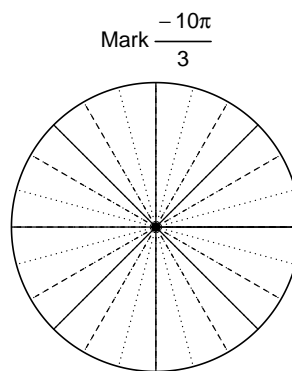


Question 2

Consider angles $\frac{13\pi}{4}$ and $\frac{-10\pi}{3}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(\frac{13\pi}{4}\right)$ and $\cos\left(\frac{-10\pi}{3}\right)$ by using a unit circle (provided separately).



Find $\sin(13\pi/4)$



Find $\cos(-10\pi/3)$

Question 3

If $\cos(\theta) = \frac{-8}{17}$, and θ is in quadrant III, determine an exact value for $\tan(\theta)$.

Question 4

A mass-spring system oscillates vertically with a frequency of 6.56 Hz, an amplitude of 2.66 meters, and a midline at $y = 9$ meters. At $t = 0$, the mass is at the maximum height. Write an equation to model the height (y in meters) as a function of time (t in seconds).